

Appln No.: 09/944,326  
Amendment Dated: August 21, 2006  
Reply to Office Action of August 7, 2006

#### REMARKS/ARGUMENTS

This is in response to the Office Action mailed August 7, 2006 for the above-captioned application. Claims 28 and 29 have been canceled in view of the Examiner's remarks, and because claim 29 appears to be a duplicate of claim 30. This amendment is believed to overcome the rejection under 35 USC § 112, second paragraph.

As to the remaining rejections, Applicants anticipate filing an appeal. The arguments made previously are incorporated herein by reference. The following additional remarks are provided.

With respect to the obviousness-type double patenting rejection, the Examiner states that "the species with modification that is claimed in the patent is an obvious variation of the generic claim of the instant application." Applicants again submit that the Examiner has never established this to be the case in a manner which permits a meaningful response. Further, this argument is inconsistent with the issuance of that patent over unavoidable prior art disclosing the base sequence.

Concerning the art rejection, the Examiner's argument is that "short" and "shorter" are equivalent in meaning such that any species of polynucleotide can be considered an oligonucleotide, no matter how long it is, so long as something is identifiable that is longer. No support is offered for this unique position. Contrary to the Examiner's position, "short" is not a relative term in ordinary usage. A person who is 6 foot 5 does not become "short" simply because there are people out there who are 7 feet tall. And there is no evidence in the record that "short" is used as a relative term when referring to oligonucleotides. There is some variation in the actual numerical values, but noting that would lead anyone of skill in the art to refer to a 1300 base pair sequence as an oligonucleotide.

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Applicants now submit that additional definitions which the Examiner indicated were missing from the earlier filing.

Respectfully Submitted,



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Attachments:

Definitions of Oligonucleotides

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## Oligonucleotide

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**Definition:**

A molecule usually composed of 25 or fewer nucleotides; used as a DNA synthesis primer.



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## oligonucleotide

[Dictionary](#)

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dic·tion·ar·ies

ol·i·go·nu·cle·o·tide (əl'ē-gō-nō'kloō-dētēd, -nyō'-, ə'lō-)

n.

\* A short polymer of two to twenty nucleotides.

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ol·i·go·nu·cle·o·tide (əl'ē-gō-nō'kloō-dētēd, -nyō'-)

n.

\* A polymeric chain of two to ten nucleotides.

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### Wikipedia



oligonucleotide

 **Oligonucleotides** are short sequences of nucleotides (RNA or DNA), typically with twenty or fewer base pairs. Oligonucleotides are often used as probes for detecting complementary DNA or RNA because they bind readily to their complements. Examples of procedures that use oligonucleotides are DNA microarrays, Southern blots, and fluorescent in situ hybridization (FISH).

Oligonucleotides composed of DNA (deoxyoligonucleotides) are often used in the polymerase chain reaction (PCR), a procedure that can be employed to amplify almost any piece of DNA. In this instance, the oligonucleotide is often referred to as a primer, or a short piece of DNA that binds to its complementary target sequence. This generates a place for a polymerase to bind and extend the primer by the addition of nucleotides to make a copy of the target sequence.

Oligonucleotides are often referred to as oligos, in "science slang".

## Antisense oligonucleotides

Antisense Oligonucleotides are strands of RNA that prevent translation of complementary RNA strands by binding to it. Antisense Oligonucleotides are being created to use on RNA that eventually produces telomerase, which is active in cancer cells.

## DNA MicroArray

DNA MicroArrays can be described as substrates (nylon, glass etc.) to which oligonucleotides have been bound at high density. Currently there exist three applications of DNA MicroArrays: polymorphism studies, gene expression studies, and tracking down certain diseases.

## Publications

Oligonucleotides, published by Mary Ann Liebert, Inc., is a peer-reviewed journal on natural or synthetic nucleic acid-based compounds such as oligonucleotides, RNA, ribozymes, RNAi, and aptamers and their biologic effects and applications both *in vitro* and *in vivo*. The clinical development of these agents, including toxicologic and pharmacologic issues are covered, as well as technology improvements and new applications of nucleic acids as tools or drugs, not only in the oligonucleotide field, but also in areas such as immune modulation or target validation.

## See also

- Amino acids are the building blocks of proteins. There are 20 natural amino acids.
- Antigen is a substance which, after take-up by an organism, elicits an immune response.
- Antibody is a protein produced by the immune system in order to protect the body against a foreign substance (antigen).

- [Chromosome](#)
- [DNA](#)
- [Epitope](#) is the smallest part of an antigen that can be recognised by an antibody.
- Fermentor In molecular biology, a fermentor is a hermetically sealed container for growing cells containing recombinant DNA.
- [Gene](#)
- [Morpholino](#)
- [Oligonucleotide](#) A short stretch of [nucleotides](#), 2 to 200 nucleotides long.
- [Polymorphism](#) The appearance in a population of the same gene in multiple forms because of mutations.
- [Polynucleotide](#)
- [Recombinant DNA](#) is DNA formed by the artificial combination of several existing DNA strands.



## Sources

PIERCE, "GENETICS: A Conceptual Approach" 2005

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## Oligonucleotide

oligonucleotide

(Science: biochemistry) Linear sequence of up to 20 nucleotides joined by phosphodiester bonds. Above this length the term polynucleotide begins to be used. A short sequence of [nucleotides.

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### Definition of Oligonucleotide

**Oligonucleotide:** A small DNA molecule composed of a few nucleotide bases. The term "oligonucleotide" applies similarly to RNA.



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### Definition of Oligonucleotide :

A molecule usually composed of 25 or fewer nucleotides; used as a DNA synthesis primer.



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# Oligonucleotide definition

Peter pxpst2 at SPAM.SUXS.unixs.cis.pitt.edu  
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In article <6pm24p\$u8l\$1 at nnrp1.dejanews.com>, ruckeri at my-dejanews.com wrote:

> This is probably a very basic thing but I am reading about DNA probes  
> (something that is new to me) and I am confused as to the exact definition of  
> an oligonucleotide. If anyone can help it would be most appreciated. Thank  
> you.

The working definition is a single strand of DNA with more than one nucleotide and less than a lot of nucleotides. These are normally made by a machine and are not more than ~40nt in length (but can be longer).

Peter



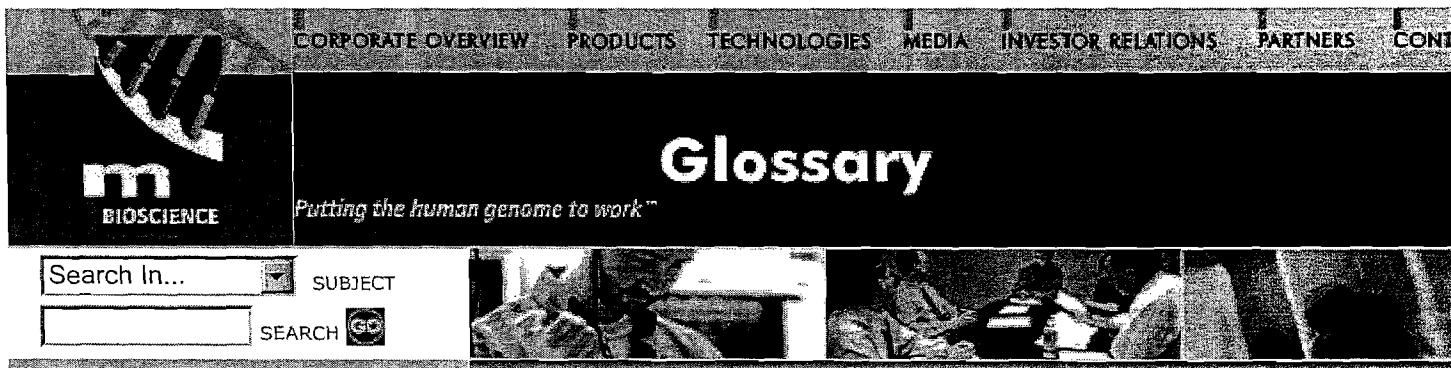
--  
"Don't you eat that yellow snow  
watch out where the Huskies go" FZ

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**Phrase: DNA**

**Definition:** the abbreviation for deoxyribonucleic acid, the self replicating material present in living organisms. This molecule is a constituent of chromosomes and is the carrier of the genetic code.

**Phrase: DNA chip**

**Definition:** a high density array of short DNA molecules bound to a solid surface which facilitates high throughput analysis of thousands of genes simultaneously. The DNA chip represents a very powerful tool capable of probing a biological sample to determine gene expression, marker pattern or nucleotide sequence of DNA/RNA.

**Phrase: DNA probe**

**Definition:** a single-stranded DNA molecule used in laboratory experiments to detect the presence of a complementary sequence among a mixture of other single-stranded DNA molecules.

**Phrase: DNA sequencing**

**Definition:** determining the order of nucleotides or bases in a specific DNA molecule.

**Phrase: SNPs**

**Definition:** single-nucleotide polymorphisms (SNPs) are single-base variations in the genetic code that occur approximately once every 1000 bases along the three billion bases of the human genome. Researchers believe that gaining knowledge of the locations of these closely-spaced DNA landmarks will ease both the sequencing of the genome and the discovery of genes related to such major human diseases such as asthma, diabetes, heart disease, schizophrenia and cancer.

**Phrase: base pair**

**Definition:** a pair of nucleotides on complementary strands of DNA or RNA. Each nucleotide base can pair with only one of the three other bases, thereby determining the sequence of a complementary strand.

**Phrase: bases**

**Definition:** one of four chemical units (nucleotides) arranged in a strand of DNA. Hydrogen bonds form between bases to make the component strands of DNA into a double helix. There are four bases in DNA, referred to as A (adenine), T (thymine), G (guanine) and C (cytosine).

**Phrase: biochip**

**Definition:** a thumbnail sized chip containing thousands of DNA probes used

**Phrase: molecular biology**

**Definition:** general term referring to study of the structure and function of proteins and nucleic acids; may be used as a synonym for genetic engineering or recombinant DNA techniques.

**Phrase: molecule**

**Definition:** a group of atoms bonded together to form a stable composition of matter.

**Phrase: mutation**

**Definition:** a permanent change in genetic material involving either a physical alteration in the chromosome or a biochemical change in the underlying DNA molecule.

**Phrase: oligo**

**Definition:** oligo is an abbreviation of oligonucleotide, which is a short sequence of nucleic acids (generally fewer than 100 bases). Synthetic oligonucleotides are used, for example, as probes to detect the presence of a complementary DNA sequence.

**Phrase: pharmacogenomics**

**Definition:** the marriage of functional genomics and molecular pharmacology. The goal of pharmacogenomics is to find correlations between therapeutic responses to drugs and the genetic profiles (or sequence variation) of patients, and use this information to discover novel, highly effective therapies.

**Phrase: phenotype**

**Definition:** a biological characteristic or trait possessed by an organism that results from the expression of a specific gene.

**Phrase: polymorphisms**

**Definition:** naturally occurring variations in the DNA sequence.

**Phrase: protein**

**Definition:** a molecule composed of amino acids arranged in a special order determined by the genetic code. Proteins are required for the structure and function of all living organisms.

**Phrase: proteome**

**Definition:** is the set of all expressed proteins for a given organism.

**Phrase: sequencing**

**Definition:** the process of determining the exact sequence of part of a DNA molecule.

**Phrase: theranostics**

**Definition:** the marriage of drug therapy and diagnostics. The goal of theranostics is to perform a diagnostic test that aids in the selection of patients and has the ability to monitor the biological effects of a drug therapy rapidly, at the point of care.



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Because of the close relationship between biochemistry and medicine, I have included in this glossary a collection of prefixes, suffixes and root words typically found in medical dictionaries in hopes that some words I may have forgotten to define can be figured out. These are in bold, with prefixes and suffixes followed or preceded by a hyphen, respectively. Roots have no hyphens. I have left words as lower case except in those cases where capitalization is necessary (named pathways for example). [Glossary](#)

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**ab-**

from

**ad-**

towards

**ADME-**

An anachronism used in drug development, meaning absorption, distribution, metabolism and excretion.

**a(n)-**

without

**absolute configuration**

The configuration of four different substituent groups around an asymmetric carbon atom; for historical reasons molecules in biochemistry are compared to D- and L-glyceraldehyde.

**absorption**

Transport of the products of digestion from the intestinal tract into the blood.

**acceptor control** (Electron transport chain)

The regulation of the rate of respiration by the availability of ADP as a phosphate group acceptor.

**accessory pigments**

Visible light-absorbing pigments such as carotenoids and xanthophyll in green plants and photosynthetic bacteria that trap energy from sunlight and pass it on to "special pairs".

**acidosis**

A condition in which blood pH decreases, either for metabolic or respiratory reasons.

**actin**

A protein (~ kDa) making up the thin filaments of muscle and cytoskeleton of eukaryotic cells.

**activation energy**

$(\Delta G^{\circ})$  The amount of energy (SI unit of joules) required to convert 1 mole of a reactant from the ground state to the transition state.

**allosteric activator**

Any molecule which positively modulates the activity of an allosteric enzyme.

**active pharmaceutical ingredient (API)**

The biologically active compound in a drug formulation that imparts the desired therapeutic effect.

**active site**

The region of an enzyme that binds a substrate molecule and catalytically transforms it, usually a small portion of the total enzyme molecule

**active transport**

Energy-requiring transport of a solute across a membrane in the direction of increasing concentration. Contrast with [passive transport](#).

<u>octa-</u>	before, against
<u>octo-</u>	eight
<u>-ogen</u>	eight
<u>-oid</u>	precursor
<u>-oid</u>	resembling, image of
<u>Okazaki fragments</u>	Okazaki fragments
<u>-ol(e)</u>	alcohol
<u>-ole</u>	little version(usually)
<u>oligo-</u>	few
<u>oligomer</u>	A short polymer of amino acids, sugars, or nucleotides. The definition of "short" is somewhat arbitrary, but usually less than 50 nucleotides or amino acids or about a dozen monosaccharides.
<u>oligomeric protein</u>	A multisubunit protein having two or more polypeptide chains.
<u>oligonucleotide</u>	A few (usually less than 50) nucleotides joined by phosphodiester bonds.
<u>olopeptide</u>	A few amino acids (usually less than 50) joined by peptide bonds.
<u>oligosaccharide</u>	Several (usually less than a dozen) monosaccharide groups joined by glycosidic bonds.
<u>-oma</u>	tumor
<u>oncogene</u>	A gene of cellular or viral origin that causes cells to exhibit rapid, uncontrolled proliferation. See also <u>proto-oncogene</u> .
<u>open reading frame (ORF)</u>	A sequence of nucleotide codons in a DNA or RNA molecule that does not include a termination codon and thus could code for a protein.
<u>open system</u>	A system that exchanges matter and energy with its surroundings. See <u>system</u> .
<u>operator</u>	A region of DNA that interacts with a regulatory protein to control the expression of a gene or group of genes.
<u>operon</u>	A unit of genetic expression in prokaryotes consisting of one or more related genes and the operator and promoter sequences that regulate their transcription.
<u>optical activity</u>	The capacity of a substance to rotate the plane of plane-polarized light.
<u>optimum pH</u>	The characteristic pH at which an enzyme has maximal catalytic activity.
<u>organelles</u>	Membrane-bounded structures found in eukaryotic cells which contain enzymes and other components required for specialized cell functions.
<u>origin</u>	The nucleotide sequence or site in DNA where DNA replication is initiated.
<u>orosomucoid</u>	An old term for $\alpha_1$ -acid glycoprotein
<u>-osis</u>	full of
<u>osmosis</u>	Bulk flow of water through a semipermeable membrane into another aqueous compartment containing solute at a higher concentration.